Safe Sites of Colorado & Rocky Mountain Remediation Services
779 Closure Project

INTEROFFICE CORRESPONDENCE

DATE November 17, 1997

TO G J Bracken, 779 Cluster Waste Streams Manager, Bldg 779A, X9881

FROM M E Hickman, Integrating Manager, 779 Closure Project, Bldg 779A, X7145 MEH

SUBJECT REVIEW OF THE 779 CLUSTER DECOMMISSIONING WASTE MANAGEMENT PLAN - MEH-008-97

This memorandum transmits the 779 Cluster Decommissioning Waste Management Plan (WMP) for review and comment The 779 Cluster Decommissioning WMP has been updated to reflect current management of the 779 Cluster Project Please provide this document to the appropriate waste management personnel for review and comment Comments are due by November 24, 1997

If you have any comments, please contact me at Extension 7145 or Kathy Zbryk at Extension 6647

ras

Attachment
As Stated

cc
M K Korenko, SSOC
K Trice, RMRS
H C Wolf, SSOC
K Q Zbryk, RMRS

Rocky Mountain
Remediation Services L L C
protecting the env ronment

779 Cluster Decommissioning Project

Waste Management Plan

Rocky Flats Environmental Technology Site

Prepared by

Rocky Mountain Remediation Services, L. L. C.

REVISION 1

NOVEMBER 1997

779 CLUSTER DECOMMISSIONING PROJECT
WASTE MANAGEMENT PLAN

REVISION 1

NOVEMBER 1997

This Waste Management Plan has been reviewed and approved by:

Mark Hickman, 779 Integration Manager	Date
Gary Bracken, 779 Waste Streams Manager	Date

This Waste Management Plan was prepared by:

Kathryn Zbryk, Environmental Scientist	Date

779 CLUSTER DECOMMISSIONING PROJECT

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ATTACHMENTS

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ACRONYMS

APO	Analytical Projects Office
ARAR	Applicable or Relevant and Appropriate Requirement
CA	Contaminated Area
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and the Environment
CFR	Code of Federal Regulations
DOE	U S Department of Energy
DOP	Decommissioning Operations Plan
EC	Environmental Coordinator
EPA	U S Environmental Protection Agency
HSP	Health Safety Practices
IDC	Item Description Code
IWCP	Integrated Work Control Program
LDR	Land Disposal Restricted
LLW	Low-Level Waste
LLM	Low-Level Mixed
NTS	Nevada Test Site
PM	Project Manager
PA	Protected Area
PCB	Polychlorinated Biphenyl
PU&D	Property Utilization and Disposal
QA	Quality Assurance
QAPP	Quality Assurance Program Plan
QC	Quality Control
RBA	Radiological Buffer Area
RCRA	Resource Conservation and Recovery Act
RFETS	Rocky Flats Environmental Technology Site
RLCR	Reconnaissance Level Characterization Report
RMRS	Rocky Mountain Remediation Services, L L C
RTR	Real-Time Radiography
TRM	TRU Mixed
TRU	Transuranic
TSCA	Toxic Substances Control Act
WAC	Waste Acceptance Criteria

WIPP	Waste Isolation Pilot Project
WMP	Waste Management Plan
WSRIC	Waste Steam and Residue Identification and Characterization

779 CLUSTER DECOMMISSIONING PROJECT
WASTE MANAGEMENT PLAN

1.0 PURPOSE

The purpose of this document is to identify the projected types and amounts of material (equipment and remediation waste) that will be generated as the result of 779 Cluster Decommissioning Project activities, hereafter called the Project In addition, waste management activities from generation through storage/disposal, will be addressed herein This plan addresses the dispositioning of materials to the Plant Utilization and Disposal (PU&D) organization, commercial recyclers, and unrestricted release of materials All waste generated by the Project will be generated, packaged, stored, transported, and disposed of, in compliance with Project specific ARARs, relevant Rocky Flats Environmental Technology Site (RFETS) Waste Management procedures and applicable Waste Acceptance Criteria (WAC) RFETS procedures have been designed to reflect applicable Department of Energy (DOE) requirements, and State and Federal regulations

The 779 Cluster Decommissioning Waste Management Plan (WMP) is a living document that will be updated as additional information or circumstances are identified All changes to this document will be reflected in the Project administrative record and all affected organizations will receive the revised information Waste projections identified in this revision are based upon engineering walkdowns that were conducted in October of 1996 through November 1997 In addition, the projected volume of industrial waste resulting from demolition of the building structure is contained herein The waste volume estimates associated with piping, conduit, and asbestos will be addressed in future revisions to this Plan Dispositioning volumes, or the volume of materials/wastes located inside of the building that must be removed prior to demolition, are contained in this WMP Removal of waste chemicals, special nuclear material, and liquids contained in idle equipment has been completed and consequently, no volume estimates are provided in this WMP

Table 4-1 provides a summary of waste volumes anticipated throughout the duration of the Project Appendix A, 779 Cluster Waste Matrix, is a room by room breakdown of the projected predominant waste types and volumes anticipated throughout the duration of the Project Appendix A does not identify hazardous and TSCA waste (polychlorinated biphenyl and asbestos) volumes on a room-by-room basis due to the ubiquitous nature of these wastes A gross volume estimate has been included on the last page of Appendix A and in Table 4-1 to complete the identification of anticipated waste types

2.0 PROJECT SCOPE

The scope of this WMP consists of the identification, packaging, storage, management and disposal of waste forms for the 779 Cluster Project Waste will be produced as the result of removal of existing equipment, such as gloveboxes, tools, facility support systems (i e , HVAC) and facility structures A detailed description of the overall Project is contained in the 779 Cluster Decommissioning Operations Plan (DOP)

The Project will generate hazardous, Low-Level Waste (LLW), Low-Level Mixed (LLM), Transuranic (TRU), TRU mixed (TRM), Toxic Substance Compliance Act (TSCA) and TSCA

mixed and sanitary waste Waste will be characterized in accordance with 1-10000-EWQA-1 6 1, Waste Steam and Residue Identification and Characterization (WSRIC) Program Description, and 1-C75-HWRM-03, Waste Identification and Analysis A pre-job assessment, and sampling and analysis, will be conducted, where necessary, to confirm the presence of hazardous and radiological contaminants within a room, a specific piece of equipment, such as a glovebox, or other components Radiological assessments and analytical data will also be used to determine if equipment can be salvaged The 779 Cluster Reconnaissance Level Characterization Report (RLCR) and the Characterization Protocols serve as the documentation for existing characterization and the basis for additional characterization The RLCR and the Characterization Protocols incorporate existing WSRIC information, sampling locations, types, and analysis requirements for sampling activities

The Project database contains an itemized listing of room contents that were inventoried through visual observation For the purposes of this WMP, an individual room volume (Appendix A) is provided Projected volumes and anticipated waste types are discussed below and are based on existing building information and process knowledge, physical building evaluations, and ongoing characterization activities Rooms were inventoried and a cubic feet (ft^3) dispositioning volume was calculated The Project database will be amended to reflect the best available inventory information in the event that new information becomes available

2.1 REGULATORY REQUIREMENTS

Regulatory requirements associated with waste management have been identified in the 779 Cluster Decommissioning Operating Plan Attachment 1, ARARs For The 779 Cluster Decommissioning Project, identifies those regulatory requirements associated with the 779 Cluster

2.2 779 CLUSTER DESCRIPTION

The primary function of the 779 Cluster, during the Cold War, was to support nuclear weapons production and plutonium pyrochemistry (recovery process development) Research and development facilities related to weapons production were located inside of Building 779 All production-related and research-related activities remain shut down Due to the shift in plant mission from weapons production to nuclear material stabilization and site cleanup, the decommissioning of the 779 Cluster will be initiated in Fiscal Year 1998 The ultimate fate of the779 Cluster is demolition

The 779 Cluster is located in the north central section of the RFETS, east of Buildings 776/777, and north of Building 750 Main structures in the 779 Cluster are the research and development facility, Building 779, a filter plenum building, Building 727, a filter plenum and emergency generator building, Building 729, a paint storage facility, Building 780, Building 782, the emergency generator facility and a cooling tower, Structure 783 Lesser structures included in the Project are Building 780A, a metal storage facility, Building 780B, a gas bottle storage facility, Building 784, cooling tower pump house, Building 785, a cooling tower pump house, and Buildings 786 and 787, cooling towers

3.0 RESPONSIBILITIES/POINTS OF CONTACT

This section of the WMP presents a management overview of the organization that will be in place to address waste management for the Project Key personnel are identified in this section of the plan and are not specific to a single contractor at RFETS Key responsibilities related to waste management are outlined below

3 1 CLOSURE PROJECT MANAGER (PM)

The Closure PM is responsible for overall management of the Project including wastes generated by his/her specific Project These responsibilities include

- Ensuring waste generator certified personnel are assigned to the Project for the purpose of packaging and verifying waste as it is generated
- Generation of waste that complies with site WAC
- Assuring adequate and timely characterization
- Projection of waste types and volumes to be generated
- Assuring planning, scheduling, and coordination for waste to be dispositioned
- Preparing cost estimates and funding for the waste that is generated

The Closure PM coordinates all Project-specific waste management issues, including preparation of the WMP and implementation thereof The Closure PM coordinates activities with the Waste Streams Manager, Project Engineer (PE), and Construction Superintendent to insure that issues associated with waste generation are addressed

3 2 WASTE STREAMS MANAGER

The Waste Streams Manager reports to the Closure PM and is responsible for coordination of waste management activities completed within the Project and supported across organizational lines The Waste Streams Manager ensures that representatives from appropriate Waste Management groups are identified at the onset of the Project and that they participate in routine Project meetings to ensure appropriate management of waste

3 3 WASTE MANAGEMENT OPERATIONS SUPPORT

3 3 1 Solid Waste Operations

Solid Waste Operations provides the following services and support for the Project

- Receipt of waste that complies with Rocky Mountain Remediation Services, L L C (RMRS) WAC from the Project
- Technical support regarding waste generation, packaging, and characterization

- Low-Level/LLM guidance through established programs
- TRU/TRM guidance through established programs
- Treatment, disposal and recycle, as available
- Storage of waste
- Assay of waste
- Review of Integrated Work Control Program (IWCP) for waste management actions

3 3 2 Waste Disposal Projects

Waste Disposal Projects is responsible for

- Off-site shipment of Project wastes and materials for disposal, treatment, and recycling
- Preparing waste for off-site shipment
- Maintaining arrangements with off-site facilities for receipt of RFETS waste
- Scheduling waste disposal activities as necessary to support Project requirements

3 3.3 Waste Certification Oversight

- Waste certification for shipment purposes

3 4 ENVIRONMENTAL COORDINATOR (EC)

The 779 Cluster has a designated EC The EC is responsible for

- Coordinating with the Waste Streams Manager to handle building-specific issues related to environmental compliance and waste management
- Interfacing with Waste Management personnel, such as technicians and inspectors, to ensure that waste management activities are scheduled in a timely manner

3 5 TRANSPORTATION MANAGER/REPRESENTATIVE

The Transportation Manager/Representative is responsible for

- Waste transfer and designating pick-up schedules
- Working with the Waste Streams Manager, Construction Superintendent, Waste Operations Representative, and EC to ensure that waste packages are transported in a timely manner to the appropriate treatment, storage, or disposal location

- Ensuring that waste packages designated for off-site shipment meet all applicable Department of Transportation requirements identified in 49 Code of Federal Regulation (CFR)

- On-site transportation of wastes from the point of generation to temporary staging or storage areas

4.0 WASTE IDENTIFICATION/GENERATION

This section of the WMP provides a detailed description of the wastes and excess materials that are expected to be generated by the 779 Cluster Decommissioning Project These estimates, including waste types and volumes, will be used as a planning tool and are not intended to replace or eliminate the need for additional characterization at the time of waste generation The Building 779 WSRIC, process knowledge, and physical evaluations of the building have been used to identify these wastes and excess materials Dispositioning volumes of LLW, LLM, TRU, TRM, TSCA, hazardous, and industrial waste are listed in Appendices A and B Presently, hazardous materials contained in idle equipment are processed by building operations personnel in compliance with the *Management Plan For Material Contained In Idle Equipment*, 94-MP/IE-0017 The 779 Cluster Decommissioning Project will manage idle equipment in accordance with the Idle Equipment Compliance Order on Consent

The Building 779 WSRIC has been revised to reflect anticipated decommissioning waste streams associated with this Project The WSRIC serves as the reference for obtaining characterization information and describes the methods for waste segregation based on Item Description Codes (IDCs) Characterization and sampling requirements are defined in the 779 Cluster Reconnaissance Level Characterization Plan, the RLCR, and related IWCPs

4 1 LOW-LEVEL WASTE

Low Level Waste is defined as radioactive waste that is not classified as high-level waste, TRU waste, spent nuclear fuel, or by-product material as identified in DOE Order 5280 2A, Radioactive Waste Management LLW contains <100 nCi/gram alpha-emitting transuranic nuclides (the net weight of the waste must be used to calculate the specific activity of the waste in each container) Historical information suggests that approximately 95 percent of the contaminated waste produced as a result of 779 Cluster decommissioning activities will be low-level in nature

Based on economic and technical constraints, items will be decontaminated to a free release condition or disposed of as low level waste This may result in reclassification of waste from radioactively contaminated to non-contaminated or vise versa Items that have been decontaminated to a free release condition in accordance with Procedure 1-P73-HSP-1810, Radioactive material Transfer and Unrestricted Release of Property and Waste, will be transferred for use at a different location within RFETS, or sent to Property Utilization and Disposal organization for appropriate handling It may also be feasible to remove contaminated portions of equipment to free-release the rest of the equipment Materials that have been decontaminated to a "free-release" level will be identified for use throughout the DOE Complex or other industries

LLW will be generated and managed in compliance with the RMRS WAC and the RFETS Low-Level WMP In accordance with RFCA, LL waste generated during this Project will be stored in a safe, monitored and retrievable manner for near-term shipment off-site, long term storage with subsequent shipment off-site and/or long-term storage with subsequent disposal on-site of the remaining wastes Anticipated LLW forms include combustibles, metal, equipment and debris Projected volumes for LL and LLM waste are 53,873 ft^3 and 557 ft^3 respectively

4 2 TRANSURANIC WASTE

Transuranic waste is defined as waste that is contaminated with alpha-emitting TRU radionuclides having half-lives greater that 20 years and concentrations ≥100 nCi/grams alpha-emitting TRU nuclides at the time of assay TRU waste, as defined, will be generated as a result of the decommissioning activities within the 779 Cluster Historical knowledge obtained from decommissioning projects suggests that less than 5 percent of the radioactive waste generated will be ≥100 nCi/gram Duct work, gloveboxes, laboratory hoods, contaminated glovebox windows, a downdraft table, and removable paint used in the decontamination process, are the primary sources of TRU and TRM waste

Approximately 66 gloveboxes have been identified for potential decontamination In the event that these gloveboxes are successfully decontaminated to <100 nCi/gram through the use of strippable paint, an estimated 1 5 drums of TRU waste (contaminated strippable paint) will be produced from each glovebox decontamination activity In the event that the decontamination process does not result in a LL waste form, the gloveboxes will be characterized as TRU waste

Cost benefit analysis and ALARA evaluations may result in no decontamination of these gloveboxes The gloveboxes, may instead, be internally coated with a radioactive contamination fixant and placed in containers suitable for shipment to the Waste Isolation Pilot Project (WIPP) providing the waste forms meet WIPP WAC and other criteria necessary to ship this waste The estimated volume of TRU waste associated with this waste management option is 75

Where feasible, items will be decontaminated to the lowest level in order to minimize the production of TRU waste TRU waste that is generated will be managed in compliance with the RMRS WAC, the TRU WMP, the WIPP Transuranic Waste Characterization Program Quality Assurance Project Plan, 95-QAPP-0050 and the 779 Cluster Authorization Basis

4 3 HAZARDOUS WASTE/MIXED WASTE

A hazardous waste is defined as waste that exhibits the characteristics of corrosivity, ignitability, reactivity, or toxicity or that is listed in 6 CCR 1007-3, Section 261, Subpart B Included in this definition is hazardous waste that has been mixed with low-level or TRU material Mixed waste is a subset of hazardous waste The 779 Cluster Decommissioning Project anticipates generating a minimum amount of hazardous waste and mixed waste Sources of hazardous and mixed waste include, but are not limited to lead, beryllium, fluorescent bulbs, drybox gloves, used chlorinated pump oil (or contaminated with metals), leaded glovebox windows and doors, and some electrical switches In addition, liquid residues may result from the treatment of debris containing listed hazardous waste Waste generated as a result of decommissioning activities will be managed in accordance with relevant RFETS waste operations procedures and Project-specific ARARs

Deactivation activities, performed prior to decommissioning, have removed the bulk of mixed waste residing in the 779 Cluster Mixed wastes which are anticipated to be generated as a result of this Project are identified in the Building 779 WSRIC The Building 779 WSRIC will be revised to address any new waste streams Mixed waste that results from decommissioning activities will be stored in temporary units in accordance with the ARARs identified in the 779 DOP

Hazardous and mixed waste (for example, radioactively contaminated lead) will be removed from gloveboxes prior to dispositioning Wherever feasible, decontamination of gloveboxes will be performed to reduce contamination levels to a point where the gloveboxes can be classified as LLW Lead that has been attached to gloveboxes and outer surface materials, such as Mycardia (plastic), will be removed and segregated while the gloveboxes are still in Building 779 Decontamination techniques are discussed in the 779 Cluster DOP

Appendix B identifies the lead lined gloveboxes, provides estimated glovebox dimensions, and the potential disposal volumes resulting from the removal and packaging of lead Additional sources of lead waste include glovebox gloves, lead bricks, Benelex™ lined doors, pendulums from a chainveyer system, and leaded aprons The estimated volume of waste from all lead sources is 557 ft^3 or fifty-two 55 gallon drums **Note:** The LLM waste volume and the waste volume from lead sources, identified above, are one in the same, in the event that the lead is non-contaminated or decontaminated to free release levels, it will be disposed of as hazardous waste or recycled otherwise the material will be disposed of as LLM waste

4 4 TOXIC SUBSTANCE CONTROL ACT WASTE

The Toxic Substances Control Act addresses all chemical substances manufactured or processed in or for the United States A chemical substance is defined in broad terms as any organic or inorganic substance of a particular identity including those substances identified in 15 CFR § 2602 (2)(A)(i-vi) and which may present unreasonable risk of injury to health and the environment

Of particular significance to the 779 Cluster are PCBs as regulated under 40 CRF Part 761 The Project estimates that 110 ft^3 of potential PCB containing ballasts exist within the 779 Cluster This estimate assumes that all of the ballasts are non-radioactive and PCB containing until the ballasts are removed, radiologically surveyed and examined (The estimate is based on packaging 100 ballasts per 55 gallon drum) Further segregation may occur as in-process characterization is performed in support of the waste determination

In addition, other suspect PCB containing materials include oils, paints, adhesives and roofing tars Characterization of suspect materials will be performed in suspect areas prior to decommissioning of that area Materials characterized as TSCA regulated will be managed in accordance with 40 CFR Part 761 if determined to contain ≥ 50 ppm PCBs

4 5 INDUSTRIAL WASTE

Industrial waste is characterized as that waste which meets RCRA Subtitle D requirements Industrial waste will be generated as a result of the 779 Cluster Decommissioning Project The waste volume associated with the demolition of the 779 Cluster structures is 1,300 yd^3 This estimate is based on 175,000 ft^3 of building to be demolished The formula used to calculate

this volume is 74 yd^3 per 10,000 ft^3 of building Richardsons Engineering Services, Inc , 1994, was used as the basis for this calculation This estimate does not include foundations, the demolition only includes removal of building structures to the ground level (slab on grade)

This waste will be managed in accordance with applicable rules and regulations Providing the rubble meets landfill WAC, it will be loaded into dump trucks and disposed of to either the on-site landfill or an off-site landfill Selective demolition and segregation of rubble will occur if radiological contamination is identified within the facilities during the final verification process

Asbestos Waste

The Project anticipates generating approximately 46,573 ft^3 of asbestos containing waste This estimate includes friable, non-friable, radioactive contaminated and non-contaminated asbestos As appropriate, and upon final radiological survey, segregation of radioactive and non-radioactive asbestos containing material will be performed Calculations for this asbestos estimate were based on a physical evaluation of the 779 Cluster facilities, empirical data, volume estimates of asbestos containing materials, and information obtained from blueprints where materials could not be accessed to measure

Asbestos containing materials will be handled in accordance with the Colorado Department of Public Health and the Environment (CDPHE), Occupational Safety and Health Act, and TSCA requirements Radioactively contaminated asbestos waste will be packaged in compliance with 1-10000-TRM-WP-2401, Asbestos Waste Management Containers will be labeled with asbestos warning labels and all other applicable labels and packaging requirements

4 6 PROPERTY UTILIZATION AND DISPOSAL MATERIALS

Property Utilization and Disposal (PU&D) materials, as defined in this WMP, are those materials that have historically been accepted for storage and reuse by PU&D These materials include, but are not limited to, office equipment such as desks, chairs, tables, carts, and bookshelves, which are located in non-contaminated areas or have been located in contaminated areas but confirmed as non-contaminated through radiological survey The estimated volume of materials designated for PU&D is 73,900 ft^3 These materials will be dispositioned to PU&D in accordance with the *Handbook For Controlling Release For Reuse Or Recycle Of Property Containing Residual Radioactive Material*

4 7 BUILDING WSRIC

The Building 779 WSRIC book describes each waste stream resulting from a process currently performed in the building Processes are described, chemicals used in the process are identified, and resulting wastes IDCs are characterized in the Building 779 WSRIC The WSRIC has been revised to reflect anticipated decommissioning waste types and will be utilized to the extent possible to ensure proper identification, characterization, and packaging/disposal requirements of these wastes are satisfied Where a waste process has not been identified in the WSRIC, the Project will request revision to the WSRIC to reflect the new process

Attachment 1

ARARs for the 779 Cluster Decommissioning Project

Federal And State ARARs for the Decommissioning of the 779 Cluster

Action	Requirement	Prerequisite	Citation	ARAR
Air Quality	Compliance with emissions	Control of emissions for smoke, particulate and volatiles of concern Implemented for construction activities, haul roads, haul trucks, demolition activities	5 CCR 1001-3 Reg 1 5 CCR 1001-9 Reg 7	Applicable
Air Quality	Compliance with NESHAP	Regulates radionuclide emissions from DOE facilities with a limit of ten mrem/yr Site standard	5 CCR 1001-10, Reg 8 40 CFR 61 Subpart H	Applicable
Air Quality	Compliance with NAAQS	Maintain quality of ambient air for criteria pollutants	5 CCR 1001-14	Applicable
Air Quality	Emission standards and compliance with asbestos work practice requirements	Standards for demolition, storage, and handling of waste Implemented through specific operational directions in IWCPs	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with Hazardous Air Pollutant Requirements	Implemented if the remedial action involves a specific regulated pollutant, eg , lead	5 CCR 1001-10 Reg 8	Applicable
Air Quality	Compliance with ozone depleting compound requirements	Ensure refrigerants are disposed of properly Approved vessel recovery method must be used	5 CCR 1001-19 Reg 15	Applicable
Solid Waste	Solid Waste Disposal Act	Requirements for disposal of solid wastes	6 CCR 1007-2	Applicable
TSCA	Disposal of PCBs	Ensure that any materials with ≥ 50 ppm for PCBs are managed according to TSCA	40 CFR Part 761	Applicable
Hazardous Waste	Compliance with Colorado Hazardous Waste Act	Identification and characterization of hazardous waste	40 CFR 261 6 CCR 1007-3, Part 261	Applicable
Generator Standards	Standards Applicable to Generators of Hazardous Waste	Generator prepares a manifest if hazardous remediation wastes are disposed of offSite	40 CFR Part 262 6 CCR 1007 3,	Applicable
TSD Facility Standards	Temporary unit container and tank storage requirements	Requirements for operation of temporary tank and container storage areas	40 CFR 264 553 6 CCR 1007-3, 264 553	Applicable
Closure	Requirement for Closure of Permitted RCRA Units	Implemented if RCRA permitted units are closed	40 CFR Part 264 6 CCR 1007-3 Part 264	Applicable

Action	Requirement	Prerequisite	Citation	ARAR
Closure	Requirements for Closure of RCRA Interim Status Units	Implemented if RCRA Interim Status Units are closed	40 CFR Part 265 6 CCR 1007 3 Part 265 as provided in RFCA Attachment 10	Applicable
LDR	Treatment standards for hazardous waste	Requirements for treatment and land disposal of hazardous waste	40 CFR 268 6 CCR 1007 3 Part 268	Applicable
Universal Waste Management	Requirements for Universal Waste Management	Governs batteries, pesticides and thermostats	40 CFR Part 273	Applicable
Used Oil Management	Requirements for Used Oil Management	Implemented if used oil is managed	40 CFR Part 279	Applicable
Water	NPDES Requirements for discharging waster into surface water bodies	Requirements for discharge of stormwater or treated wastewater into surface water bodies	40 CFR Part 122 and 125 5 CCR 1002 8	Applicable
Low Level Waste Disposal	Low Level Waste Disposal	Requirements governing offSite disposal of low level radioactive waste	10 CFR Part 61 6 CCR 1007-14	Applicable
Radiation Protection	Standards for radiation protection	Establishes the criteria for the protection of human health and the environment	DOE 5400 5	TBC
Radioactive Waste Management	Radioactive Waste Management	Requirements for the management and packaging of LLW	DOE Order 5420 2A	TBC

C - Chemical Specific ARAR
L - Location Specific ARAR
TBC - To Be Considered

4 8 WASTE ESTIMATES

The waste estimates anticipated as a result of the Project are summarized in Table 4-1 In addition, Appendix A provides waste estimates on a room-by-room basis The types and volumes of waste have been estimated based on the following assumptions

- If a room was not posted as a radiological hazard, all materials contained in the room were considered non-contaminated and, therefore, suitable for dispositioning through PU&D

- Materials contained in rooms identified as Radiological Buffer Areas (RBAs), that were not suspected of being contaminated and can be confirmed as non-contaminated through smear surveys, were also considered suitable for PU&D Examples of such materials are desks, cabinets, and chairs

- Any materials that were located in a RBA and were not suitable for smear surveys were considered LLW Examples of such material are electronic equipment that cannot be surveyed sufficiently to confirm non-contamination

- Material/waste segregation was considered to be appropriate in Contaminated Areas (CAs) providing an item could be surveyed

- Office equipment, excluding computers, located in a CA were deemed suitable for dispositioning to PU&D Decommissioning historical knowledge is the basis for this assumption Survey data will be used to confirm this assumption

- Gloveboxes containing plutonium residuals are anticipated to produce TRU waste through the decontamination process, specifically STRIPCOAT™ application Additional volumes of TRU waste may result from decommissioning activities such as ducting removal will be estimated in future revisions to the WMP

- All other materials that were located in a CA were considered LLW although materials may require decontamination to achieve low-level status

Each room estimate identified in Appendix A was calculated by summing the cubic feet of materials inventoried in a room The LLW volume was determined by subtracting the PU&D volume, that is to say the volume of material estimated to be suitable for PU&D from the total room estimate The resulting low-level volume was then multiplied by 125 percent to compensate for container size limitations (not all of the volume of a waste crate can be utilized) The LLM waste volume waste was determined by estimating the volume of and final volume which would result from size reduction

The TRU waste volumes estimated in Table 4-1 are primarily derived from plutonium contaminated gloveboxes Approximately 66 gloveboxes have been identified for decontamination using STRIPCOAT™ Each glovebox is anticipated to generate 1 5 drums of TRU waste, resulting in 100 drums of TRU waste

The quantity of crates and drums were estimated using the following information On average, 7 8 cubic feet of material can be contained in a 55 gallon drum while 112 cubic feet can be

contained in a standard waste crate Lead and waste resulting from decontamination (such as dry combustibles) will be placed into 55 gallon drums All other materials will be placed into standard waste containers except those materials designated for PU&D which will be shipped directly to PU&D The number of standard waste containers (crates) was calculated by dividing the volume by 112 cubic feet and rounding off to the nearest whole number The quantity of 55 gallon drums was calculated by dividing the volume of waste designated for containment in drums by 7 8 cubic feet then rounding to the nearest whole number

Further refinement regarding the number of containers may result from non-standard sized equipment and materials which may be placed into oversized containers providing the equipment or material has been confirmed as low level The LLW Program will be consulted prior to generation of any LLW which may require non-standard packaging to ensure that the waste disposal facility and the department of transportation requirements can be met TRU materials will be size reduced in order to meet disposal facility waste acceptance criteria

Table 4-1 Waste Volumes

WASTE TYPE	VOLUME (ft^3)	CRATES	DRUMS
Low Level	53,873	481	0
Low Level Mixed			
*	101	0	18
**	406	0	52
TRU/TRM***	784	0	100
PU&D	73,900	0	0
Industrial Waste	175,000	0	0
Asbestos Waste	46,572	0	416
TSCA Waste	101	0	13

* Sources of hazardous waste estimates include fluorescent bulbs, electrical switches, lighting ballasts and leaded gloves

** Sources of this hazardous waste estimate are lead removed from gloveboxes An additional 50 ft^3 is included for lead brick and miscellaneous lead items

*** Sources of this estimate are strippable paint removed from contaminated gloveboxes, a downdraft table, and a glovebox window

5.0 WASTE CHARACTERIZATION

Waste characterization for the 779 Cluster Decommissioning Project will be performed in accordance with requirements identified in the RFETS *Hazardous Waste Requirements Manual*, the *Low-Level Waste Management Plan*, the RMRS *Waste Acceptance Criteria*, the *Building 779 Waste Steam and Residue Identification and Characterization* and established procedures The procedures that will be used are identified in Section 11 0, References Waste characterization will or has been accomplished using several methods including

5 1 VISUAL INSPECTIONS

Preliminary visual inspections have been conducted in the 779 Cluster Materials contained in each room have been documented Physical dimensions of equipment and items were used to calculate the estimated volume of waste or materials designated for PU&D A master database

has been created to catalog items that have been observed in the rooms Rooms that could not be inventoried will be included in the WMP when access is permitted Room 153B and all vault areas were inaccessible at the time when visual inspections were conducted The master database and the WMP will be revised to reflect additional inventory information as it becomes available

5 2 USE OF PROCESS KNOWLEDGE

Process knowledge documentation for waste streams associated with the 779 Cluster can be found in the Building 779 WSRIC Manual

5.3 CHARACTERIZATION SAMPLING

The 779 Cluster Reconnaissance Level Characterization Survey Report serves as the documentation for the physical, chemical and radiological conditions of the facility and will contain the preliminary facility characterization information This characterization information is the result of facility walkdowns, process knowledge evaluations, and review and analysis of existing data This document also designates where further characterization assessment is necessary

Sampling activities in the 779 Cluster will be performed by qualified Decommissioning personnel Waste identification and characterization support is obtained through Subject Matter Experts as needed Sampling is also coordinated with the Analytical Projects Office (APO) The APO coordinates the sampling requests with two (2) on-site laboratories Where Resource Conservation and Recovery Act (RCRA) characterization is required, Test methods for Evaluating Solid Waste, Physical/Chemical Methods, U S EPA SW-846, 1986, Third Edition (or current version) is used for sampling and analysis Process knowledge, quality control procedures, waste characterization, and WAC certification procedures are integrated into field procedures used to support characterization requirements The specifics associated with the locations, types, and analysis requirements for sampling activities are outlined in the 779 Cluster Reconnaissance Level Characterization Survey Report and the 779 Cluster Characterization Plan

5 4 NONDESTRUCTIVE EXAMINATION/NONDESTRUCTIVE ASSAY

During the progression of the Project, various radioactivity measurement instruments will be utilized to quantify the radioactive materials and contamination present inside of gloveboxes and ventilation ducts, and on equipment and building surfaces These measurements will be used to estimate quantities of radioactive contamination present prior to and following the glovebox decontamination process Measurements will be performed on gloveboxes and lateral duct work connecting the gloveboxes to the main header A strippable paint (STRIPCOAT™), or equivalent, will be used to decontaminate the gloveboxes in an attempt to reduce contamination levels to a point where they can be classified as LLW, as feasible Other technologies are under investigation for use in decontamination of contaminated equipment and may be used in conjunction with or instead of removable paint

Once the waste is packaged for disposal, it will be assayed prior to being shipped from the site RFETS utilizes Nondestructive Assay (NDA) methods, specifically passive/active methods which involves neutron generation and measurement of gamma rays resulting from the neutron

interaction NDA will be used to determine levels of radioactivity for waste classification purposes When the radionuclides in a volume of bulk material, typically contained in a drum, box, or tank, emit gamma radiation, direct external measurements can be used to identify and/or quantify the radioactive material inside Gamma radiation is detected using plastic scintillators, sodium iodide crystals, or germanium crystals RFETS has two active NDA units, a drum assay unit which is located in Building 371 and a crate assay unit, located in Building 569

Real-Time Radiography (RTR) is an imaging technique utilized to examine the contents of waste containers prior to shipment A container is placed between an X-ray tube and a detector (screen, image intensifier, and television camera) The image formed is viewed on a real-time basis so that motion, such as that resulting from the movement of free liquids when rotating the drum, can be detected by viewing the container RTR provides additional information to assist in certification of the contents of a waste container prior to shipment

5 5 RADIOCHEMISTRY

Radiochemistry will be conducted on samples obtained from the surface of materials (for example, a paint sample), liquids contained in process lines and liquids contained in pumps to determine their radiological content The analyses will include total activity, gross alpha/beta, and isotopic analysis for Plutonium 239 The data will be used to further characterize the wastes generated

6.0 DECOMMISSIONING PROJECT WASTE VERIFICATION

Waste verification activities will be conducted by trained personnel assigned to the Project Waste characterization, packaging, and quality assurance requirements for LLW will be in accordance with the NTS WAC (NTSWAC,RO 9/96) Procedures and policies for managing LLW are outlined in the RFETS Low-Level WMP

Waste verification of TRU wastes will be conducted by the Waste Operations Group in accordance with the RFETS TRU WMP Wastes will be certified in accordance with the WIPP TRU Waste Characterization Program Quality Assurance Project Plan and the TRU WMP Certified waste inspectors will perform the required inspections on waste generated from the 779 Cluster Inspections will be conducted on the waste as it is generated and prior to final closure of the containers

7.0 WASTE PACKAGING

Waste generated by the Project will be segregated at the time of removal The waste will then be packaged and staged for further decontamination, survey, recycle, processing, or packaging Full waste crates will be packaged and shipped to Building 569 for assay Drums will be assayed in Building 371 Waste Operations, in conjunction with the Project, will designate the storage location for LLW It is expected that the majority of LL and TRU waste will initially be stored in Building 779 and later shipped to approved on-site storage at RFETS or to an off-site disposal facility

RFETS approved containers will be used to contain Project generated or dispositioned waste that has been surveyed and packaged Special containers may be used, under certain

circumstances, to contain materials that may not fit into standard waste containers (reference Section 4 7) The Project will notify the effected waste management organization and obtain guidance if this occurs Non-contaminated recyclable materials, such as scrap metal, may be placed in approved crates and later segregated into PU&D supplied bins for ease of removal Additional items may be placed onto pallets and rolloffs for shipment to PU&D

Radioactively contaminated lead may be generated as a result of this Project and managed as mixed waste until it can be shipped off-site for decontamination and recycling A commercial contractor is being considered to take custody of the lead under an Nuclear Regulatory Commission license for eventual decontamination and free release If this cannot be accomplished, on-site lead decontamination methods will be evaluated to determine the feasibility of on-site decontamination, free release, and recycling

Liquid wastes drained from process lines may produce mixed wastes if radioactive contamination is detected Aqueous wastes, if contaminated, will be sent to on-site treatment facilities where available

Release of non-contaminated material, debris, and equipment is accomplished through characterization by demonstrating that the materials or wastes do not exhibit any of the characteristics of hazardous waste as identified in Subpart C of 6 CCR 1007-3 Part 261 or are excluded under the provisions in Subpart D Process knowledge and operating history related to the facilities can also be used in the waste determination process Further sampling and analysis of wastes will be performed on relevant waste forms to determine if the wastes are regulated as Land Disposal Restricted (LDR), or if the wastes can be exempted under the "hazardous debris rule " LDR requirements are integrated into RFETS waste and characterization procedures to ensure compliance with designated treatment, storage, and disposal facilities and on-site WAC

Under the "hazardous debris rule" provision, and in accordance with the debris treatment standards defined in 6 CCR 1007-3 SS268 45, treated hazardous debris is excluded from the definition of hazardous waste, provided that the debris is treated to the performance or design and operation standards by an extraction or destruction technology, and the treated debris does not exhibit the characteristic of a hazardous waste The excluded debris can be disposed of in an industrial landfill (6 CCR 1007-3, Section 268, Subpart D) rather than a RCRA permitted landfill (6 CCR 1007-3, Section 268, Subtitle C) Note that these exemptions apply to disposal of certain low-level radioactive mixed wastes if they meet the receiving Site WAC for hazardous debris

8.0 INTERIM STORAGE, TRANSPORTATION, AND FINAL DISPOSITION

Remediation waste generated during the 779 Cluster Decommissioning Project will be stored in a manner that is environmentally safe, and is in compliance with 779 Cluster ARARs Compatible waste will be stored in competent containers within temporary units The temporary unit will be established and maintained in accordance with the provisions contained in 6 CCR 1007-3, Part 264 553, Temporary Units Physical and chemical characteristics of the waste will be considered when designating an area as a temporary unit to ensure that the area does not pose a threat to human health and the environment Temporary units may be established within Building 779, on the east loading dock of Building 779, or in the area surrounding the 779 Cluster

A graded approach will be used with respect to the structure of temporary units The potential for release from the unit will be evaluated and the structure of the unit will be designed to ensure that operation of the unit will not pose a threat to human health and the environment A temporary unit identified for storage of low level waste, for example, would be identified using caution tape barrier whereas jersey barriers might be used to surround a temporary unit containing TRU remediation waste Additional precautions might include placing a tarp over waste containers to protect them from the weather An assessment will be performed to determine the need for secondary containment Secondary containment will be provided, as appropriate when liquid wastes are stored or treated in tanks or containers A weekly visual inspection of waste contained in these temporary units will be performed to ensure the appropriateness of the temporary unit and container integrity

Wastes that will not be shipped directly off-site will be relocated in a timely manner to appropriate interim on-site storage as designated by Waste Operations Waste Operations personnel will provide site surveillance support to ensure that wastes are being managed in a

The RFETS Transportation group will be involved in developing the requirements for off-site transportation of waste to the selected disposal or treatment site The Project will comply with the *Rocky Flats Transportation Safety Manuals* to ensure all relevant transportation requirements are met

Table 8-1, Summary of Waste Management For The 779 Cluster Project, identifies the waste streams, the type of on-site packaging, the final disposition for that specific waste form, and the estimated waste volume

Table 8-1 SUMMARY OF WASTE MANAGEMENT FOR THE 779 CLUSTER PROJECT

WASTE STREAM	ON-SITE PACKAGING	FINAL DISPOSITION	ESTIMATED WASTE VOLUME
ASBESTOS, NON-RADIOACTIVE • Friable • Non-friable	Gray 55 gallon drum or strong tight boxes, friable- 6 mm plastic double bagged	• Friable-Kettlemen • Non-friable- U S A Waste	Total estimate for friable, non-friable, radioactive and non-radioactive is 46,572 ft^3
ASBESTOS, RADIOACTIVE • Friable • Non-friable	White 55 gallon drums or crate, 6 mm plastic double bagged, or strong tight boxes/crates	• No disposal facility currently available	Volume of radioactive asbestos is included in total above
PCBs, NON-RADIOACTIVE • Ballasts, non-leaking	Black and yellow drum with a plastic liner	• Chem Waste contract to Rollins Inc at Deerpark, TX	Estimate of 101 ft^3 includes radioactive and non-radioactive
PCBs NON-RADIOACTIVE • Leaking ballasts and all other regulated PCBs (articles, etc)	Black and yellow drum with plastic liner, document on traveler if TSCA regulated	• Chem Waste contract to Rollins Inc at Deerpark, Tx	Segregation of radioactive from non-radioactive materials will occur when these materials are surveyed
PCBs, RADIOACTIVE • Ballasts, non-leaking (LLW only, not TSCA regulated)	White drum with a plastic liner	• Oak Ridge	Segregation of radioactive from non-radioactive materials will occur when these materials are surveyed

PCBs, RADIOACTIVE • Leaking ballasts and all other rad contaminated (LLW) and TSCA regulated wastes	White drum with a plastic liner	• Oak Ridge	Segregation of radioactive from non-radioactive materials will occur when these materials are surveyed
Hazardous Waste, NON RADIOACTIVE • Fluorescent tubes • Solvents, paints, lead, chemicals, metals	Black and white drum • tubes crushed on-site	• Chem Waste Contract	Estimates included below
Mixed Wastes, RADIOACTIVE • Non-homogeneous • Homogeneous	White 55 gallon drum	• Non homogeneous LLMW does not have a designated disposal site at this time • Oak Ridge (LLM and LL solvents) • Envirocare, Utah	Conservative estimate of 557 ft^3, mixed waste will be segregated from hazardous through radiological survey
Low Level Waste • Plaster, wall materials, windows, panels, cement, etc	White drum or white boxes ½ or full size wooden crates complying with WO-1100 or WO-4034	• Nevada Test Site	• 53,873 ft^3
Sanitary or Industrial Waste NON-RADIOACTIVE	Roll offs, either 20 or 30 yard roll offs	• U S A Waste, Erie, Colorado	• 175,000 ft^3
TRU Waste	On-site storage	• WIPP	Estimate of 784 ft^3 includes both TRU and TRM Under the non-decontamination scenario, approximately 2400 ft^3 of TRU/TRM would be generated
TRU Mixed Waste	On-site storage	• On-site storage	Estimate of 784 ft^3 includes both TRU and TRM Under the non-decontamination scenario, approximately 2400 ft^3 of TRU/TRM would be generated
PU&D materials	Not regulated under RCRA (file cabinets, shelves, desks, lab benches, etc)	• In accordance with PU&D procedures or • In accordance with RFETS contracts	73,9000 ft^3

9.0 WASTE MINIMIZATION

Waste minimization will be utilized in the planning, generation and management of Project generated wastes Waste minimization will be accomplished using a waste life-cycle approach in addition to the standard segregation, reuse, and substitution practices incorporated into daily Project activities Elimination and reduction of waste generated as a result of decommissioning is of high priority Standard decontamination operations and processes will be evaluated for waste minimization potential and suitable minimization techniques will be implemented If the cost is greater to demonstrate that the item is not contaminated than to pay for waste disposal, the item will be disposed of as waste

Opportunities for waste minimization through scrap metal recycle are dependent on successful decontamination operations confirmed through radiation surveys Equipment will be decontaminated to the greatest extent practical then surveyed in support of waste minimization Contamination survey data may result in partial or full release of a piece of equipment for scrap metal recycle Scrap metal waste projections will be provided to Waste Minimization as survey data becomes available

10.0 COMPLETION REPORT

Upon completion of the Project, a Project completion report will be prepared This report will include a listing of the wastes removed from the building, characterization data, and waste dispositioning information (e g , size reduction, decontamination, or treatment) which contributed to the final forms and volumes of the wastes resulting from this Project

11.0 REFERENCES

Hazardous Waste Requirements Manual

Health and Safety Plan, RFETS, Rev 0 February 1996

RFETS Low-Level Waste Management Plan

Rocky Flats Transportation Safety Manuals

RMRS Waste Acceptance Criteria, Rev 0, July 1996

TRU Waste Management Plan

WIPP Transuranic Waste Characterization Program Quality Assurance Project Plan, 95-QAPP-0050

Waste Stream and Residue Identification and Characterization, Building 779-V5 0

1-M12-WO-4034, Radioactive Waste Packaging Requirements

4-D99- WO-1100, Solid Radioactive Waste Packaging Inside of the Protected Area

1-10000-EWQA, TSCA Management Plan

1-C80-WO-1102-WRT, Waste/Residue Traveler Instructions

1-10000-WP-1024, Asbestos Waste Management

1-15310-HSP 13 04, Beryllium Protection

1-10000-EWQA, Section 1 5

Appendix A

779 Cluster Waste Matrix

779 Cluster Waste Matrix

BUILDING	ROOM NUMBER	ROOM CLASSIFICATION	ROOM ESTIMATE (lb)	[illegible] WASTE (lb)	[illegible] MIXED WASTE (lb) (b-c-d)	TRU WASTE (lb)	[illegible] (lb)	[illegible]	[illegible]
779	001	RBA	246	0	0	0	246	0	0
779	Main Hallway 1 floor	Non Contaminated	215	0	0	0	215	0	0
779	100 Vestibule	Non Contaminated	187	0	0	0	187	0	0
779	101 Hall	Non Contaminated	215	0	0	0	215	0	0
779	101A	Non Contaminated	57	0	0	0	57	0	0
779	103/103A 103B Mens Locker Room	Non Contaminated	2572	0	0	0	2572	0	0
779	104 Elevator	Non Contaminated	0	0	0	0	0	0	0
779	105	Non Contaminated	152	0	0	0	152	0	0
779	106	Non Contaminated	261	0	0	0	261	0	0
779	107	Non Contaminated	513	0	0	0	513	0	0
779	108	Non Contaminated	74	0	0	0	74	0	0
779	109	Non Contaminated	249	0	0	0	249	0	0
779	110	Non Contaminated	248	0	0	0	248	0	0
779	110A	Non Contaminated	171	0	0	0	171	0	0
779	111 Hallway	Non Contaminated	250	0	0	0	250	0	0
779	113	Non Contaminated	2960	0	0	0	2960	0	0
779	114	Non Contaminated	27 428	0	0	0	27 428	0	0
779	115	Non Contaminated	3189	0	0	0	3189	0	0
779	115A	Non Contaminated	826	0	0	0	826	0	0
779	116 Hallway to Dock	Non Contaminated	646	0	0	0	646	0	0
779	116A	Non Contaminated	130	0	0	0	130	0	0
779	117	Non Contaminated	908	0	0	0	908	0	0
779	118 Dumb Waiter	CA	0	0	0	0	0	0	0
779	119 Hallway	RBA	0	0	0	0	0	0	0
779	120 Changing Room	Non Contaminated	103	0	0	0	103	0	0
779	121	Non Contaminated	1628	0	0	0	1628	0	0
779	121A	Non Contaminated	414	0	0	0	414	0	0
779	121B Guard Station	Non Contaminated	174	0	0	0	174	0	0
779	122	RBA	1348	0	0	0	1348	0	0
779	123 Decon Room	RBA	0	0	0	0	0	0	0
779	124	RBA	332	0	0	0	332	0	0

*CA Contamination Area
RBA- Radiological Buffer Area
**HCA High Contamination Area

779 Cluster Waste Matrix

BUILDING	ROOM NUMBER	ROOM CLASSIFICATION	ROOM ESTIMATE (ft3)	LL WASTE (ft3)	LL MIXED WASTE (ft3)	TRU WASTE (ft3)	[illegible] (ft3)	[illegible]	[illegible]
779	125	RBA	512	0	0	0	512	0	0
779	126	RBA	1055	1271	0	0	38	0	11
779	127	RBA	6989	8244	0	0	395	0	74
779	128	RBA	174	13	0	0	173	0	0 5
779	129 Stairwell	RBA	0	0	0	0	0	0	0
779	130	RBA	57 5	72	0	0	0	0	1
779	131	CA	962	1046	31	16	125	6	9
779	132	RBA	374	253	0	0	172	0	2
779	133	CA/ HCA	1485	1843	80	80	111	20	17
779	134	RBA	163	0	0	0	163	0	0
779	135	RBA	122	0	0	0	122	0	0
779	136	RBA	236	0	0	0	236	0	0
779	137	RBA	1421	1323	20	64	363	13	12
779	138 Hall	RBA	292	233	0	0	106	0	2
779	139	RBA	642	503	0	0	240	0	5
779	140	RBA	531	664	0	0	0	0	6
779	140A	RBA	289	330	0	0	25	0	3
779	140B	RBA	172	120	0	0	76	0	1
779	141	RBA	374	170	0	0	238	0	2
779	141A	RBA	348	276	0	0	128	0	3
779	141B	RBA	345	276	0	0	124	0	3
779	141C	RBA	200	149	0	0	81	0	1
779	142	RBA	819	539	0	0	460	0	5
779	143 Airlock	CA	0	0	0	0	0	0	0
779	144 Elevator	CA	0	0	0	0	0	0	0
779	145	CA	174	35	0	0	146	0	0 5
779	146	CA	653	3	0	0	651	0	0
779	147	CA	26	8	0	0	18	0	0
779	148 Airlock	CA	0	0	0	0	0	0	
779	149 Annex Hallway	CA	420	450	0	0	60	0	
779	150	CA	4007	4720	0	16	860	2	2
779	151	CA	225	0	0	0	225	0	0
779	152	CA	606	494	17	32	277	6	
779	153	CA	36	54	0	0	0	0	0 5
779	153A	CA	55	83	0	0	0	0	1
779	153B	HCA	49	0	0	49(1)	0	0	0 4

CA Contamination Area
RBA Radiological Buffer Ar

779 Cluster Waste Matrix

BUILDING	ROOM NUMBER	ROOM CLASSIFICATION	ROOM ESTIMATE (lb)	LLW (lb)	LLW MIXED WASTE (lb) (LLW)	TRU WASTE (lb)	DUMD (lb)	DRUMS	CRATES
779	154	CA	1938	2081	84	96	273	23	19
779	155	CA	1157	1201	0	48	196	6	11
779	156	CA	291	426	0	0	18	0	4
779	157	CA	971	1041	0	0	138	0	9
779	159	CA	658	662	0	0	128	0	6
779	160	CA	2217	2361	62	64	328	16	21
779	160A Vault	CA	112	65	0	0	112	0	1
779	161	CA	57	72	0	0	0	0	1
779	162	Non Contaminated	1626	0	0	0	1626	0	0
779	163	CA	83	104	0	0	0	0	1
779	164 Airlock	CA	0	0	0	0	0	0	0
779	165 Womens Locker	CA	0	0	0	0	0	0	0
779	166 Womens Locker	Non Contaminated	0	0	0	0	0	0	0
779	167 167A Womens Locker	Non Contaminated	758	0	0	0	758	0	0
779	170 Dumb Waiter	CA	0	0	0	0	0	0	0
779	171 Vault	CA	4415	5481	151	0	30	19	49
779	172 Vault	CA	476	675	26	0	476	3	6
779	173 Vault	CA	216	269	0	0	1	0	2
779	2 floor hallway	CA	32	4	0	0	29	0	0
779	201	Non Contaminated	289	0	0	0	289	0	0
779	201A/B	Non Contaminated	322	0	0	0	322	0	
779	202	Non Contaminated	633	0	0	0	633	0	0
779	202A	Non Contaminated	190	0	0	0	190	0	0
779	203	Non Contaminated	357	0	0	0	357	0	0
779	204	Non Contaminated	90	0	0	0	90	0	0
779	204A	Non Contaminated	7	0	0	0	7	0	
779	204B	Non Contaminated	306	0	0	0	306	0	
779	205	Non Contaminated	668	0	0	0	668	0	0
779	206	Non Contaminated	462	0	0	0	462	0	0
779	207	Non Contaminated	104	0	0	0	104	0	
779	207A	Non Contaminated	70	0	0	0	70	0	
779	207B	Non Contaminated	169	0	0	0	169	0	0
779	207C	Non Contaminated	67	0	0	0	67	0	0

CA Contamination Area
RBA Radiological Buffer Area

779 Cluster Waste Matrix

BUILDING	ROOM NUMBER	ROOM CLASSIFICATION	ROOM ESTIMATE (lb)	LLW (lb)	MIXED WASTE (lb) (est)	TRU WASTE (lb)	DRUMS	BOXES	CRATES
779	208	Non Contaminated	425	0	0	0	425	0	0
779	209	Non Contaminated	289	0	0	0	289	0	0
779	210 210A	Non Contaminated	183	0	0	0	183	0	0
779	211	Non Contaminated	60	0	0	0	60	0	0
779	212 212A	Non Contaminated	195	0	0	0	195	0	0
779	213	Non Contaminated	844	0	0	0	844	0	0
779	214	Non Contaminated	432	0	0	0	432		
779	215 Airlock	RBA	0	0	0	0	0	0	0
779	216 Hallway	CA	326	104	0	0	243		1
779	217	CA	1062	1063	0	64	212	8	10
779	218	CA	1155	1178	0 4	48	370	7	11
779	219 Abandoned Womens Restroom	CA	77	0	0	0	77	0	0
779	220	CA	1196	1029	14	48	373	8	9
779	221	CA	245	139	0	0	134	0	1
779	221A	CA	126	55	0	0	82	0	0 5
779	221B	CA	145	64	0	0	94	0	1
779	221C	CA	79	46	0	0	42	0	0 5
779	222	CA	3130	3675	54	80	190	17	33
779	222A	CA	185	50	0	0	0	0	0 5
779	223	CA	838	1018	0	0	24	0	9
779	224	CA	116 3	145	0	0	0	0	1
779	225	CA	463	394	0	0	149	0	
779	226 Stairwell	CA	0	0	0	0	0	0	0
779	228	CA	4553	3641	8	64	1640	9	33
779	229	CA	245	19	0	0	230	0	0
779	230	CA	159	40	0	0	127	0	0
779	231	CA	386	365	0	0	94	0	3
779	232	CA	227	0	0	0	227	0	0
779	233	CA	333	13	0	0	323	0	0
779	234	CA	947	655	0	64	423	8	6
779	234A	CA	64	76	0	0	3	0	1
779	234B	CA	269	336	0	0	0	0	3
779	235	CA	446	520	0	0	30	0	5
779	236 Airlock	CA	0	0	0	0	0	0	0
779	237 Hallway	CA			0	0			

*CA Contamination Area
* RBA Radiological Buffer Area

779 Cluster Waste Matrix

BUILDING	ROOM NUMBER	ROOM CLASSIFICATION	ROOM ESTIMATE (ft3)	LLL WASTE (ft3)	MIXED WASTE (ft3) (LLW)	TRU WASTE (ft3)	INDUSTRIAL (ft3)	DRUMS	CRATES
779	270	CA	593	566	10	0	140	2	5
779	271	CA	216	149	0	0	97	0	1
779	272	CA	578	631	0	0	72	0	6
779	273	CA	65	21	0	0	48	0	0
779	274	CA	123	99	0	0	44	0	1
779	275	CA	192	115	0	0	100	0	1
779	277	CA	100	53	0	0	58	0	0 5
779	Docks	Non Contaminated	2026	0	0	0	2026	0	0
727	N/A	Non Contaminated	1508	0	0	0	1508	0	0
782	N/A	Non Contaminated	2723	0	0	0	2723	0	0
783	N/A	Non Contaminated	101	0	0	0	101	0	0
			SUM	53873	557 4	784	73900	173	486 9

' Room 153B contains a contaminated downdraft table and a GB window that are expected to be TRU waste

The low level mixed waste estimates are specific to potentially contaminated lead affixed to gloveboxes

The estimate for industrial waste specifically structural rubble for the demolition of the 779 Cluster is 175 000 ft3

The estimate for asbestos waste contained in the 779 Cluster is 46 572 ft3

*CA- Contamination Area

**RRA- Radiological Buffer Area

Appendix B

Building 779 Leaded Gloveboxes

APPENDIX 2

BUILDING 779 LEADED GLOVEBOXES

ROOM	ITEM	DIMENSIONS OF GLOVEBOX	DISPOSAL VOLUME (ft3)
131	GB 131-A, lead epoxied on	3 5x3 5x4	3 92
131	GB 131-B, lead epoxied on	3 5x3 5x4	3 92
131	GB 131-D, lead epoxied on	4x3 5x4	4 48
131	GB 131-E, lead epoxied on	4x3 5x4	4 48
131	GB-961, lead bolted on	5x7x5	14
133	GB-953, lead epoxied on	3x4x5	4 8
133	GB-954, lead bolted on	3 5x6x4	6 72
133	GB-955, lead bolted on	3 5x9x4	10 08
133	GB-956, lead bolted on	6x4x3 5	6 72
133	GB-957, lead bolted on	7x3 5x4	7 84
133	GB-958, lead bolted on	5x10x6	24
133	GB-959, lead epoxied on	4x18x3 5	20 16
137	GB-106-1, lead bolted on	5x4x3	4 8
137	GB-106-2, lead bolted on	4x4x3	3 84
137	GB-106-3, lead bolted on	4x4x3	3 84
137	GB-106-4, lead bolted on	4x4x3	3 84
137	GB-106-5, lead bolted on	4x4x3	3 84
152	GB-208, lead epoxied on	4x4x8	10 24
152	GB-211, lead epoxied on	3x9x3	6 48
154	GB-1363, lead bolted on	4 5x14x6	30 24
154	GB-1364, lead bolted on	4 5x14x6	30 24
154	GB-1365 lead bolted on	3x7x6	10 08
154	GB-4933, lead bolted on	3x7x4	6 72
154	GB-7248, lead epoxied on	3x6 5x4	6 24
160	GB-857, lead epoxied on	4x9x4	11 52
160	GB-859 lead epoxied on	11x3x4	10 56
160	GB-860, lead epoxied on	8 5x6 5x2	8 84
160	GB-863, lead epoxied on	3x2x4	1 92
160	GB-864, lead epoxied on	8x8x2	10 24
160	GB-865, lead bolted on	5x2 5x4 5	4 5
• Approximately 50 ft^3 of additional lead is anticipated from lead brick aprons pendulums and shie			
160	GB-866, lead epoxied on	6x4x3	5 76

APPENDIX 2
BUILDING 779 LEADED GLOVEBOXES

ROOM	ITEM	DIMENSIONS OF GLOVEBOX	DISPOSAL VOLUME (ft3)
160	GB-867, lead epoxied on	6x4x4	7 68
160	GB-868, lead epoxied on	2x3x3	1 44
218	GB-970, lead shielding around glove ports	1 5x1 5x3	0 36
220	GB-462, lead bolted on	3x9x4	8 64
220	GB-974, lead epoxied on	3x6x4	5 76
222	GB-460, lead bolted on	3 5x6x3 5	5 88
222	GB-105, lead bolted on	3 5x4x4	4 48
222	GB-230, lead bolted on	6 5x8x4	16 64
222	GB-3339, lead epoxied on	4x12x3	11 52
222	GB-330-371, lead epoxied on	8 5x4x3 5	9 52
222	GB-976, lead epoxied on	3x4x3 5	3 36
222	GB-977, lead epoxied on	5x2x3 5	2 8
228	GB-199, lead epoxied on	3x4x8	7 68
270	GB-2115, lead epoxied on	3x6x3 5	5 04
270	GB-972, lead bolted on	3x3x3 5	2 52
270	GB-973, lead bolted on	3x3x3 5	2 52
* Approximately 50 ft^3 of additional lead is anticipated from lead brick aprons pendulums and shiel			
		SUM	406